MICHIGAN ENVIRONMENTAL SCIENCE BOARD

CHILDREN'S STANDARDS INVESTIGATION PANEL
MEETING SUMMARY
WEDNESDAY, MARCH 31, 1999
COURTYARD BY MARRIOTT
7799 CONFERENCE CENTER DRIVE
BRIGHTON, MICHIGAN

PANEL MEMBERS PRESENT
Dr. John A. Gracki, Chair
Dr. George T. Wolff
Dr. Michael DeVito
Dr. Michael A. Kamrin
Dr. William B. Weil
Mr. Keith G. Harrison, Executive Director

MDEQ/OSEP SUPPORT STAFF PRESENT
Mr. Jesse Harrold, Environmental Officer
Ms. Patricia Hiner, Executive Secretary

I. CALL TO ORDER

Dr. John A. Gracki, Chair, called the meeting of the Michigan Environmental Science Board (MESB) Children's Standards Investigation Panel (Panel) to order at 9:00 a.m.

II. EXECUTIVE DIRECTOR UPDATE

Mr. Harrison provided a brief summary of the material that had been submitted to the Panel to date, including letters from Representative Elizabeth Brater and from the Children's Environmental Health Network. Both letters contained several items of concern to the authors as well as policy suggestions for the Panel to consider. Mr. Harrison stated that he had responded to both letters indicating that the role of MESB was not to recommend policy but rather to make recommendations to specific concerns or questions raised by the Governor based on the best available science and technology.

III. PANEL DISCUSSION

Dr. Gracki indicated that it had been suggested that Dr. Etzel deal with exposure hazards in food and questioned whether this could be included in the response to the charge from the Governor. Mr. Harrison stated that the MESB had been specifically requested to look at the Department of Environmental Quality (DEQ) administered standards, which do not include food. However, if the Panel considered this exposure an area of concern that should be addressed in order to better evaluate a child's risk, it could be identified as a deficiency. Such a determination could be addressed in the

second part of the Governor's charge, which talks about identifying those environmental standards that may need to be reevaluated, and the third part of the charge, which asks for the type of research that would be needed to address the deficiency.

Dr. Weil stated that the literature did not address what has been done regarding the concerns about children, and that no one has adequately addressed the question of whether children are different from adults. He added that children have different exposures, different metabolisms, different sizes, and vulnerable periods. This has been recognized, but is not in the regulations. Dr. Wolff clarified that in some of the air quality standards, particularly the ozone, the population at risk was identified to be children and the risk assessments were done specifically for them. Dr. DeVito suggested that perhaps exposure standards could be established for different periods of development, such as from age one to eight and age eight to 20. He stated that the reference dose (RfD) which is normally used is not child specific. Measuring exposures over a lifetime can obscure potentially high exposures during childhood.

Ms. Christine Flaga (Environmental Response Division, DEQ) stated that the Part 201 soil criteria incorporated an age-adjusted rate for soil ingestion and dermal exposures. Exposure duration is considered to be 30 years for residential exposures, and except for the soil direct contact criteria, adult exposures are usually considered. In situations where developmental data exist, the exposure assumptions can reflect the immature animal, or children. However, toxicity data often are generated in lifetime or chronic studies. This can cause a problem when applying the data to children's exposure.

Dr. Weil noted that the U.S. Environmental Protection Agency (USEPA) had recommended adding an additional safety factor in the case of inadequate data along with the ten-fold factors for intra- and interspecies conversions. Ms. Flaga indicated that this third factor had not been utilized in their current regulations. She added that children's health, and the efforts made to address this issue, had not been explicitly discussed in their documents, but should be included. Dr. DeVito stated that Congress had recommended a safety factor to account for areas of uncertainty. This factor could be from one to ten. Mr. Dennis Bush (Surface Water Quality Division, DEQ) stated that in the case of database gaps, the factor commonly used for food and water was three. Dr. DeVito noted that some people at the USEPA do not agree with adding this additional factor, considering the interspecies factor to provide adequate protection for sensitive individuals. Dr. Kamrin added that in addition to these explicit uncertainty factors, there were implicit safety factors built into the process of risk assessment, including sensitive species, sensitive endpoints, etc. Dr. Weil read from the November 1998 draft of a document entitled *Data Exposure to Children's Health,* which indicated that "when data specific to children's health are missing or inadequate for a particular pesticide, application of the database modifying factor in addition to the ten-fold intraspecies variability factor is considered appropriate to account for the possibility that children may be significantly more sensitive than adults." He continued by stating that the document indicated that the size of this factor would vary.

Dr. Kamrin noted that regulations deal with single chemicals and there might be some advantages of regulations that take a more multimedia type of approach. Dr. DeVito stated that it was important to look at aggregate risk, and to consider all the various routes of exposure. A child will breathe the air and drink the water while playing in the soil. He may be exposed to less than the maximum level, or RfD, of all three media individually, but the aggregate exposure may be harmful. In addition, one article from the *Consumers' Union* reported that as many as 22 different chemicals were found on one food product. The cumulative effect of these chemicals has not been addressed. Mr. Harrison noted that there could also be synergistic and antagonistic effects. Dr. DeVito agreed but indicated that methods were not currently available to calculate the synergistic and antagonistic effects of the possible mixtures of chemicals. He added that it was not possible to complete a risk assessment if there was no methodology available to perform such a task. It was noted that this was where further research could be recommended.

Dr. DeVito stated that there is currently a research program at the USEPA that attempts to address the complex issue of assessing risks from exposures to multiple compounds. Dr. Kamrin noted that one problem with the risk assessment process is that policies to regulate different media have evolved in different divisions of the USEPA, making coordination difficult. Also, some exposures, such as indoor air, which is not currently regulated, can have a larger effect than those that are being regulated. This could mean that changing the current regulations will not produce a maximal effect.

Dr. DeVito asked whether the methodologies were actually part of the regulations. Ms. Flaga responded affirmatively. She added that most regulations are written in a manner that allows some flexibility. There is always a concern about having the ability to use professional judgment and incorporate new methods, or new data. Dr. Weil suggested that regulations could be written that include the recognition that multiple exposures could have compounding effects, and that methodologies to assess these effects would be incorporated, as they become available.

Mr. Bush noted that in the Surface Water Quality Division, the regulations include relative source contributions. This takes into account exposures from other media and addresses the issue of additivity. For example, drinking water regulations assume a relative source contribution of 20 percent. For example, if the maximum exposure to a certain chemical is one milligram, then the allowable level in the water is two-tenths of a milligram because eight-tenths are assumed to come from elsewhere. This is not the same method used to determine allowable exposures in other media, making multimedia assessment difficult. Dr. DeVito stated that determination of exposure to a chemical should include whether exposure through all pathways is greater than what can be said is a safe level. Dr. Weil added that the toxic effect was of concern, rather than the chemical itself. The same toxic effect could come from multiple chemicals, and is more serious if it occurs at a vulnerable age.

Dr. Kamrin stated that drinking water was an area of concern due to microbial as well as chemical contaminants. Mr. Harrison noted that this was also mentioned in the letter from Representative Brater, and that water is definitely one of the areas which is regulated by the DEQ. He added that it was important to examine the specific methodologies used by the DEQ, along with how and when professional judgment was exercised, and what type of data was used. Dr. Devito clarified that the methods that the Panel would be considering included determination of the RfD as a measure of toxicity and also an exposure assessment.

Dr. Weil noted that a deficiency in much of the literature was that factors that may alter the RfD in regard to children have not been identified. He stated that children not only have different exposures, but also have different metabolic problems with an error intake per kilogram of body weight that is double that of an adult. In addition, their diet in the first year of life consists of a very limited number of foods and is very dependent on water supply. Saying that the Panel had been charged with determining how the regulations protect children, Dr. Weil stated that these factors should be taken into account.

Dr. Gracki concurred that the factors and manners of exposure that were specific to children needed to be addressed. He characterized the problem as being inherent in the RfD, with the value generally based on adult toxicity multiplied by various factors. If a child's exposure is below the RfD, then this is probably not a problem. However, if the exposure is greater than the RfD for children, this raises more questions about the significance of this value and the calculations behind the RfD. Dr. Kamrin noted that the regulation of many chemicals is ahead of the available science. Standards are developed for both children and adults with insufficient data.

Dr. Weil stated that while the lack of available data was at times appalling, the addition of safety factors was one method of accounting for vulnerable individuals. He noted that effects on a newborn carry a much greater impact than those on an elderly adult, adding that substantial increases in the incidence of serious childhood disease suggest an environmental impact that cannot be ignored. Dr. Weil stated that additional safety factors should be considered to address any large data gaps found in the science.

IV. PANEL ASSIGNMENTS

Dr. Gracki asked Dr. Kamrin to articulate his ideas on how best to organize the writing assignments for the report. Dr. Kamrin stated that previous discussions had focused on a number of concerns, and that individual Panel members had particular interests in some of these areas. Dr. Weil is concerned with whether the regulations adequately deal with exposures in soils, while Dr. Wolff has expertise in ambient air quality issues, and Dr. Etzel is involved in the issues surrounding food. Dr. Kamrin added that his interest is with the risk assessment process. Dr. DeVito stated that he could deal with the RfD issue and critique the regulations from that viewpoint, and volunteered to write a section about exposures from water.

Mr. Harrison noted that the report needs to be finished by June 30, and because much of the next meeting is anticipated to be taken up with presentations, it is important to begin now on the writing assignments. Having portions of the report in written form will facilitate more focused and productive discussion. Dr. DeVito added that although this would be an initial draft and require modification, it would help the group to achieve some degree of consensus. Dr. Wolff requested that Dr. DeVito forward a copy of his part of the report to him as soon as possible so that he could reference it in his statements. Dr. DeVito responded that he should have something in writing by the middle of April.

V. PUBLIC COMMENT

Dennis Leonard (Detroit Edison) stated that much of the basis for the DEQ standards is the database that has been created by the USEPA. This database has been compiled according to quite explicit procedures, including some which consider various factors about children's health. Mr. Leonard suggested that these procedures could be helpful for developing standards. Dr. Kamrin added that approximately ten years ago the USEPA had published an article that explained this process. It was noted that this article would be a helpful document.

Mary Beth Doyle (Ecology Center) stated that she was concerned that the Panel would be concentrating on media-specific issues, rather than on multiple exposures and multiple routes of exposure. She stressed the need to identify information or the lack thereof, regarding the additive and synergistic effects, as well as possible antagonistic effects. Ms. Doyle cited a study by Warren Porter in Madison, Wisconsin, where he studied the effects of common mixtures of fertilizers and pesticides in groundwater. She said that although she did not have a copy of this study to give the Panel, she would provide the citation.

William Perez asked the Panel to focus on the regulations. He stated that as a member of the regulating community he interacts with the DEQ on a regular basis. He said that in remediation work, it was required to evaluate and address accumulative risk. Ms. Flaga noted that the remediation program is a chemical specific, media specific program. Mr. Perez responded that it is, except when risk assessments are generated. He stated that toxicologists from the DEQ will sometimes request that multiple contaminants are addressed. This may be on sites where the state is interacting with the federal government, such as superfund sites. Ms. Flaga clarified that the vast majority of 201 sites were not superfund sites, and so were not required by the USEPA to have such an extensive assessment. She added that it would make sense to look at all chemicals that are involved.

Ann Susing stated that regulations are only useful if they are enforced. She added that, in her experience, regulations are often not enforced and gave the ongoing problems with lead poisoning of children as an example.

VI. NEXT MEETING DATE

The next meeting of the Panel will be on April 29, 1999.

VII. ADJOURNMENT

The meeting was adjourned at 10:45 a.m.

Respectfully submitted,
Keith G. Harrison, M.A., R.S., Cert. Ecol.
Executive Director
Michigan Environmental Science Board